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67) An apparatus for the control of both central and obstructive sleep apnea using electrical stimulation on a demand basis. Implantable sensors (44,46) monitor the respiration cycle and determine the occurrence of apnea events. Sensing means (76,92,92) sense central apnea by the passage of an escape interval of time without the sensing of an inspiratory event. Obstructive sleep apnea is sensed by a sensing means (78) as an abnormal pressure differential across the airway. The diaphragm is electrically stimulated by a stimulating means (98,104,54) upon sensing of central apnea. The musculature of the upper airway is electrically stimulated by a stimulating means (100,102,52) upon sensing of an occurrence of obstructive sleep apnea. Stimulation of the upper airway is provided whenever central apnea is sensed.

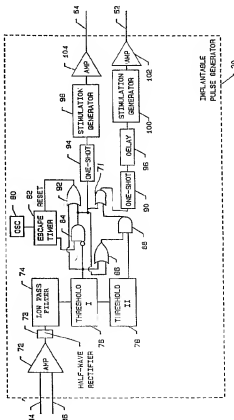


FIG. 6



European Patent  
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# EUROPEAN SEARCH REPORT

Application Number

EP 92 30 2397

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	ASAI0 TRANSACTIONS vol. 34, no. 3, July 1988, HAGERSTOWN, MD US , XP53246 M. BRONIAOWSKI ET ALL 'New horizons in Dynamic Rehabilitation of Paralyzed Laryngeal Functions' * abstract *	1, 11	A61N1/36
A	ELECTRONIQUE APPLICATIONS. no. 47, April 1986, PARIS FR J. TREMOLIERES 'La ventilation artificielle par stimulation electrique' * page 76 - page 77 *	1, 11	
A	MEDICAL AND BIOLOGICAL ENGINEERING AND COMPUTING vol. 25, no. 4, July 1987, STEVENAGE GB page W KIMURA 'A heart-rate-responsive diaphragm pacemaker' * the whole document *	1, 11	
D,A	US-A-4 506 666 (DURKHAN) * abstract *	1, 11	TECHNICAL FIELDS SEARCHED (Int. Cl.5)
D,A	US-A-4 830 008 (MEER) * abstract *	1, 11	A61N
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 10 DECEMBER 1992	Examiner TACCOEN J-F.P.L.
CATEGORY OF CITED DOCUMENTS			
<p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p>		<p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons * : member of the same patent family, corresponding document</p>	

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